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1 April 2004

The International Bureau of WIPO
34 Chemin des Colombettes
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"Amendment of the claims under Article 19(1) (Rule 46)"

Re: International Application No. PCT/JP2003/013520
Applicant: DAIWABO CO., LTD.
Agent: IKEUCHI SATO & PARTNER PATENT ATTORNEYS
International Filing Date: 23 October 2003
Our Ref.: H1925-01

Dear Sirs:

The Applicant, who received the International Search Report relating to the above-identified International Application transmitted on 17 February 2004, hereby files amendment under Article 19(1) as in the attached sheets.

That is, claims 1 and 25 are amended, claim 30 is canceled and claims 2-24, 26-29 and 31-32 are retained unchanged.

The Applicant also files as attached herewith a brief statement explaining the amendment and indicating any impact that amendment therein might have on the description and drawings.

Sincerely yours,

Hiroyuki Ikeuchi

IKEUCHI SATO & PARTNER PATENT ATTORNEYS
Representative Partner
Hiroyuki IKEUCHI

Attachment:
(1) Amendment under Article 19(1) 3 sheets
(2) Brief Statement 1 sheet

CLAIMS

1. (Amended) An organic electrolyte battery separator, which is composed of a nonwoven comprising a heat-and-humidity gelling resin capable of gelling by heating in the presence of moisture and another fiber,

the other fiber being fixed with a film-like gel material obtained by causing the heat-and-humidity gelling resin to gel under heat and humidity and be pressed and spread, and

the nonwoven having a mean flow pore diameter of 0.3 to 5 μm and a bubble point pore diameter of 3 to 20 μm as measured in accordance with ASTM F 316 86.

2. The organic electrolyte battery separator according to claim 1, wherein the heat-and-humidity gelling resin is a heat-and-humidity gelling fiber, the heat-and-humidity gelling resin being provided at least at a portion of a surface of the heat-and-humidity gelling fiber.

3. The organic electrolyte battery separator according to claim 1, wherein a proportion of the nonwoven occupied by the heat-and-humidity gelling resin is in a range of 10 to 50 mass%.

4. The organic electrolyte battery separator according to claim 1, wherein the heat-and-humidity gelling resin is an ethylene-vinyl alcohol copolymer.

5. The organic electrolyte battery separator according to claim 1, wherein the other fiber has a fiber diameter of 15 μm or less.

6. The organic electrolyte battery separator according to claim 1, wherein an average fiber diameter of the other fiber constituting the nonwoven is 10 μm or less.

7. The organic electrolyte battery separator according to claim 1, wherein the fiber constituting the nonwoven other than the heat-and-humidity gelling resin is an olefin fiber.

8. The organic electrolyte battery separator according to claim 1,

wherein a surface of the nonwoven is partially covered with a film-like gel material.

20. The organic electrolyte battery separator according to claim 19, wherein an area proportion of the film-like gel material with respect to an entire surface of the nonwoven is in a range of 40% to 90%.

21. The organic electrolyte battery separator according to claim 1, wherein a contact angle of dechlorinated water dropped on a surface of the nonwoven is 60 degrees or less 5 seconds after dropping of the dechlorinated water.

22. The organic electrolyte battery separator according to claim 1, wherein the nonwoven has a puncture strength of 2 N or more and a standard deviation of 1.1 N or less.

23. The organic electrolyte battery separator according to claim 22, wherein a variation index of the puncture strength of the nonwoven is 0.165 or less, the variation being calculated from the puncture strength and the standard deviation using the following expression:

variation index of puncture strength = standard deviation/puncture strength.

24. The organic electrolyte battery separator according to claim 1, wherein the separator has a thickness in a range of 15 to 80 μm and the nonwoven has a specific volume in a range of 1.2 to 2.5 cm^3/g.

25. (Amended) A method for producing an organic electrolyte battery separator, which is composed of a nonwoven comprising a heat-and-humidity gelling fiber in which a resin capable of gelling by heating in the presence of moisture is present on at least a portion of a surface of the fiber, and another fiber, the method comprising at least all of the following steps A to D of:

A. preparing a nonwoven sheet comprising the heat-and-humidity gelling fiber and the other fiber;

B. subjecting the nonwoven sheet to a hydrophilic treatment;

C. providing moisture to the hydrophilic-treated nonwoven sheet

to obtain a water-containing sheet; and

D. subjecting the water-containing sheet to gel processing by pressing and a heat-and-humidity treatment using a heat treatment device that is set to a certain temperature within a range of no less than a temperature at which the heat-and-humidity gelling resin gels and no more than "the melting point of the heat-and-humidity gelling resin - 20°C", to cause the heat-and-humidity gelling resin to gel and be pressed and spread to form a film, and fixing the other fiber using the heat-and-humidity gelling resin gel.

26. The organic electrolyte battery separator producing method according to claim 25, wherein an average fiber diameter of the nonwoven sheet is 10 μm or less.

27. The organic electrolyte battery separator producing method according to claim 25, wherein a proportion of the moisture provided to the hydrophilic-treated nonwoven sheet is in a range of 20 to 300 mass%.

28. The organic electrolyte battery separator producing method according to claim 25, wherein a contact angle of dechlorinated water dropped on a surface of the hydrophilic-treated nonwoven sheet is 60 degrees or less 5 seconds after dropping of the dechlorinated water

29. The organic electrolyte battery separator producing method according to claim 25, wherein the hydrophilic treatment is an exposure to fluorine gas atmosphere.

30. (Canceled)

31. The organic electrolyte battery separator producing method according to claim 25, wherein the gel processing is press processing using a thermal roller, and a line pressure of the thermal roller is in a range of 350 to 10000 N/cm.

32. An organic electrolyte battery comprising the separator according to claim 1.